



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,291	09/26/2003	Miwa Kozawa	031181	6427
38834 7590 11/12/2009 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER CHACKO DAVIS, DABORAH				
ART UNIT 1795		PAPER NUMBER		
NOTIFICATION DATE 11/12/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

### Office Action Summary

**Application No.**

10/670,291

**Applicant(s)**

KOZAWA ET AL.

**Examiner**

DABORAH CHACKO DAVIS

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,5,7,8 and 13-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,7,8 and 13-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 5, 7-8, 13-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication No. 2001-109165 (Kanda et al., hereinafter referred to as Kanda) in view of U. S. Patent No. 5,981,147 (Hallock et al., hereinafter referred to as Hallock) and U. S. Patent Application Publication No. 2002/0192593 (Nagai et al., hereinafter referred to as Nagai)

Kanda, in the abstract, in [0001], [0013], [0017], [0019], [0020], discloses a coating material that fattens the resist pattern (resist pattern thickening material, includes an ArF resist such as acrylic resin) comprising a water-soluble resin, a non-ionic surfactant, and an organic solvent (claims 1-2, 5, and 13). Kanda, in [013], discloses that the water-soluble resin of the coating material is a polyvinyl alcohol. Kanda, in [0013], discloses that the water-soluble resin is a heterocyclic compound such as a polyvinyl pyrrolidone (has a cyclic structure) (claims 7-8). Kanda, in [0020], discloses that the organic solvent is an alcohol solvent (claim 14). Kanda, in the abstract, in [0002], [0011], [0012], [0013], [0019], [0020], [0033], discloses forming a resist pattern (resist pattern to be thickened) for a semiconductor device, forming a coating material (enveloping layer, reference 3 of figures 1, and 2) on the formed resist

pattern, wherein the coating material (resist pattern thickening material) fattens the resist pattern, said coating material includes a resin, a surfactant, and an organic solvent (claims 15-16, and 18). Kanda, in [0022], [0023], [0024], discloses that the developing processing is performed after the formation of the coating material on the resist pattern (claim 17).

The difference between the claims and Kanda is that Kanda does not disclose the surfactants recited. Kanda does not disclose the claimed amount of surfactant in grams/100g of the resin.

Hallock, in col 5, and col 6, lines 55-62, discloses a composition that comprises a resin, an organic solvent and a non-ionic surfactant such as phenol ethoxylate.

The difference between the claims and Kanda in view of Hallock is that Kanda in view of Hallock does not disclose the claimed amount of surfactant in grams/100g of the resin.

Nagai, in [0621], discloses that the amount of surfactant is 2 parts by weight for 100 parts by weight of the resin.

Therefore, it would be obvious to a skilled artisan to modify Kanda by employing the surfactant taught by Hallock because Hallock, in col 6, lines 55-61, discloses that using non-ionic surfactants enable adequate storage, and that phenol ethoxylate surfactants provide shear stability to the composition. It would be obvious to a skilled artisan to modify Kanda in view of Hallock by employing the claimed range of surfactants as suggested by Nagai because Nagai, in [0617], through [0621], discloses

that using the surfactants in the claimed range in a resist composition improves the applicability of the composition and developability as a resist.

3. Claims 19-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication No. 2001-109165 (Kanda et al., hereinafter referred to as Kanda) in view of U. S. Patent No. 5,981,147 (Hallock et al., hereinafter referred to as Hallock) and U. S. Patent Application Publication No. 2002/0192593 (Nagai et al., hereinafter referred to as Nagai) and further in view of U. S. Patent No. 6,319,853 (Ishibashi et al., hereinafter referred to as Ishibashi).

Kanda, in the abstract, in [0002], [0011], [0012], [0013], [0019], [0020], [0033], discloses forming a resist pattern (resist pattern to be thickened, includes an ArF resist such as acrylic resin) for a semiconductor device, forming a coating material (enveloping layer, reference 3 of figures 1, and 2) on the formed resist pattern, wherein the coating material (resist pattern thickening material) fattens the resist pattern, said coating material includes a resin, a surfactant, and an organic solvent. Kanda, in [013], discloses that the water-soluble resin of the coating material is a polyvinyl alcohol. Kanda, in [0013], discloses that the water-soluble resin is a heterocyclic compound such as a polyvinyl pyrrolidone (has a cyclic structure) (claim 19). Kanda, in [0011], discloses that the resist material (for forming the resist pattern, the resist pattern to be thickened) is an acrylic resist (claim 20).

The difference between the claims and Kanda is that Kanda does not disclose the surfactants recited. Kanda does not disclose the claimed amount of surfactant in grams/100g of the resin.

Hallock, in col 5, and col 6, lines 55-62, discloses a composition that comprises a resin, an organic solvent and a non-ionic surfactant such as phenol ethoxylate.

The difference between the claims and Kanda in view of Hallock is that Kanda in view of Hallock does not disclose using the resist pattern to pattern the underlying layer. Kanda in view of Hallock does not disclose the claimed amount of surfactant in grams/100g of the resin.

Nagai, in [0621], discloses that the amount of surfactant is 2 parts by weight for 100 parts by weight of the resin.

The difference between the claims and Kanda in view of Hallock and Nagai is that Kanda in view of Hallock and Nagai does not disclose using the resist pattern to pattern the underlying layer

Ishibashi, in col 24, lines 2-25, discloses that the thickened resist pattern (second resist pattern, after developing the coating material formed on the resist pattern) is used as an etching mask to etch the underlying layer (semiconductor substrate).

Therefore, it would be obvious to a skilled artisan to modify Kanda by employing at least one of the claimed surfactants as taught by Hallock because Hallock, in col 6, lines 55-61, discloses that using non-ionic surfactants enable adequate storage, and that phenol ethoxylate surfactants provide shear stability to the composition. It would be obvious to a skilled artisan to modify Kanda in view of Hallock by employing the claimed

range of surfactants as suggested by Nagai because Nagai, in [0617], through [0621], discloses that using the surfactants in the claimed range in a resist composition improves the applicability of the composition and developability as a resist. It would be obvious to a skilled artisan to modify Kanda in view of Hallock and Nagai by employing the etch process suggested by Ishibashi because Kanda, in [0002], discloses that the resist pattern formed can be used as an etching resist mask to manufacture semiconductor devices and circuit boards.

4. Claims 21-22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication No. 2001-109165 (Kanda et al., hereinafter referred to as Kanda) in view of U. S. Patent No. 5,981,147 (Hallock et al., hereinafter referred to as Hallock) and U. S. Patent Application Publication No. 2002/0192593 (Nagai et al., hereinafter referred to as Nagai) and further in view of Japanese Patent Application Publication No. 2000-38362 (Kobayakawa et al., hereinafter referred to as Kobayakawa).

Kanda in view of Hallock and Nagai is discussed in paragraph no. 2, above. The difference between the claims and Kanda in view of Hallock and Nagai is that Kanda in view of Hallock and Nagai does not disclose that the resin composition includes an adamantanol.

Kobayakawa in the abstract, discloses that adamantanol is included in the resist composition (resin containing).

Therefore, it would be obvious to a skilled artisan to modify Kanda in view of Hallock and Nagai by employing an adamantanol in the resin composition as taught by

Kobayakawa because Kobayakawa, in the abstract, discloses that adamantanol is useful starting material in the manufacturing of the resist compositions and that using adamantanol enables products of high purity.

### ***Response to Arguments***

5. Applicant's arguments, see Remarks, filed June 23, 2009, with respect to claims 1-2, 5, 7, 8, and 13-20, have been fully considered and are persuasive. The 35 U.S.C. 112 rejection and 35 U.S.C. 103 (a) rejections of claims 1-2, 5, 7, 8, and 13-20, have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Hallock. See paragraph no. 2, and 3, above.

A) Applicants argue that none of references teach the claimed surfactants recited in the independent claims, viz., primary alcohol ethoxylate and a phenol ethoxylate compound.

Neither Kanda nor Enoki nor Nagai is relied upon to disclose the claimed surfactants. Hallock is depended upon to disclose the use of non-ionic surfactants such as phenol ethoxylate. See paragraph nos. 2, and 3.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within



TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Daborah Chacko-Davis/  
Examiner, Art Unit 1795

November 7, 2009.